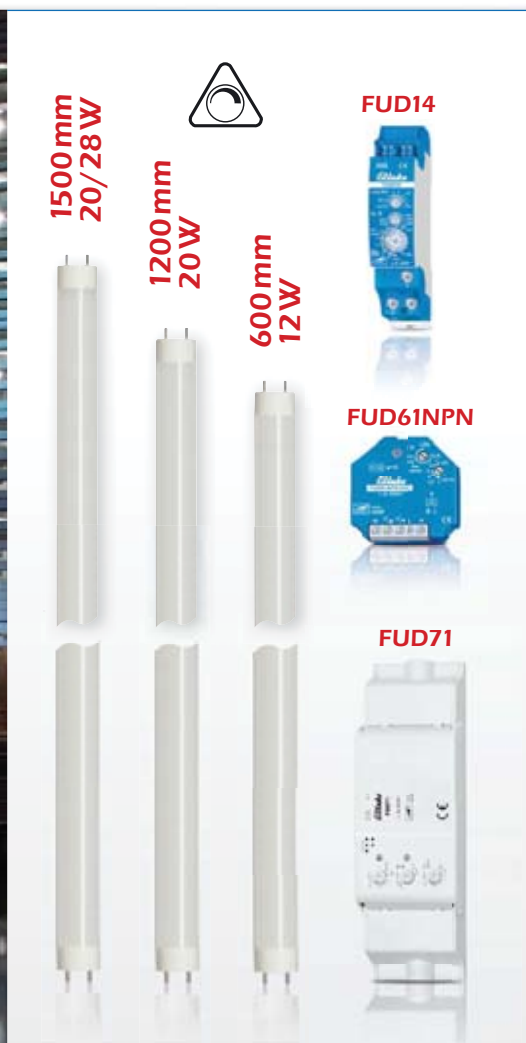





NEW



Dimmable 230 V LED tubes

up to 140 lumen per watt and universal dimmer switches with wireless control

Exchanging fluorescent tubes with dimmable LED tubes not only saves a great deal of energy and money. At the same time, constant light control is just as simple as light scene control. Quite apart from normal light dimming to obtain cosy lighting.

- Energy consumption drops by at least 50%. Energy efficiency class A++.
- Service life is up to 10 times longer and this means a considerable reduction in replacement costs that far outweigh the higher prices for the lamps.
- Dimmable LED tubes can also be switched to 100% brightness without dimmer.
- Universal dimmer switches are controlled by batteryless and wireless pushbuttons. Any number of LED tubes can be dimmed collectively using the wireless dimmer switches FUD71. The FUD14 caters for up to 400 W and the FUD61NPN for up to 300 W.
- All dimmable Eltako LED tubes have been certified by KEMA-KEUR to EN and IEC regulations and therefore bear the test mark: 

Dimmable 230V LED Tubes

LR068, 600 mm, 12W and LR128, 1200 mm, 20W

2

NEW**LR068..M-12W**

230V LED tubes 600 mm long, 27 mm diameter, 12W power consumption, luminous flux up to 1680 lm, colour rendering index $R_a > 83$, colour temperatures 3000K, 4000K, 5000K or 6500K. Socket G13, reflected beam angle 140°, enclosure in frosted plastic.

Of course dimmable LED tubes can also be undimmed when switched.

LED tubes are an energy-saving alternative to classic fluorescent tubes and have a much more pleasant illumination. No flickering on switch-on, no flickering in operation, no UV radiation, no IR radiation, no major colour change and no black ends due to ageing.

LED tubes contain no mercury and after up to 50.000 operating hours, they are therefore not classified as hazardous waste but as recyclable electronic scrap.

Tubes with conventional single or double switched electromagnetic ballasts (conventional and low loss ballast) can be simply replaced by tubes and starters.

For technical data, see page 4, dimmer switches from page 5 and the safe LED tube connection system from page 10.

NEW**LR128..M-20W**

230V LED tubes 1200 mm long, 27 mm diameter, 20W power consumption, luminous flux up to 2800 lm, colour rendering index $R_a > 83$, colour temperatures 3000K, 4000K, 5000K or 6500K. Socket G13, reflected beam angle 140°, enclosure in frosted plastic.

Of course dimmable LED tubes can also be undimmed when switched.

LED tubes are an energy saving alternative to classic fluorescent tubes and have a much more pleasant illumination. No flickering on switch-on, no flickering in operation, no UV radiation, no IR radiation, no major colour change and no black ends due to ageing.

LED tubes contain no mercury and after up to 50.000 operating hours, they are therefore not classified as hazardous waste but as recyclable electronic scrap.

Tubes with conventional single or double switched electromagnetic ballasts (conventional and low loss ballast) can be simply replaced by tubes and starters.

For technical data, see page 4, dimmer switches from page 5 and the safe LED tube connection system from page 11.

LR06830M-12W	LED tubes 600 mm, 12 W, 3000K, warm white	EAN 4010312401286	63,80 €/pc.
LR06840M-12W	LED tubes 600 mm, 12 W, 4000K, cool white	EAN 4010312401293	63,80 €/pc.
LR06850M-12W	LED tubes 600 mm, 12 W, 5000K, daylight	EAN 4010312401309	63,80 €/pc.
LR06865M-12W	LED tubes 600 mm, 12 W, 6500K, cool daylight	EAN 4010312401385	63,80 €/pc.
LR12830M-20W	LED tubes 1200 mm, 20 W, 3000K, warm white	EAN 4010312401316	93,80 €/pc.
LR12840M-20W	LED tubes 1200 mm, 20 W, 4000K, cool white	EAN 4010312401323	93,80 €/pc.
LR12850M-20W	LED tubes 1200 mm, 20 W, 5000K, daylight	EAN 4010312401330	93,80 €/pc.
LR12865M-20W	LED tubes 1200 mm, 20 W, 6500K, cool daylight	EAN 4010312401392	93,80 €/pc.
LRS	LED tubes starter bridge (Only for spare part orders. 1 unit is enclosed with every LED tube free of charge.)	EAN 4010312400913	1,00 €/pc.

Recommended retail price plus statutory VAT.

NEW

LR158..M-20W



230V LED tubes 1500 mm long, 27 mm diameter, 20W power consumption, luminous flux up to 2800 lm, colour rendering index $R_a > 83$, colour temperatures 3000K, 4000K, 5000K or 6500K. Socket G13, reflected beam angle 140°, enclosure in frosted plastic.

Of course dimmable LED tubes can also be undimmed when switched.
LED tubes are an energy-saving alternative to classic fluorescent tubes and have a much more pleasant illumination. No flickering on switch-on, no flickering in operation, no UV radiation, no IR radiation, no major colour change and no black ends due to ageing.
LED tubes contain no mercury and after up to 50.000 operating hours, they are therefore not classified as hazardous waste but as recyclable electronic scrap.

Tubes with conventional single or double switched electromagnetic ballasts (conventional and low loss ballast) can be simply replaced by tubes and starters.

For technical data, see page 4, dimmer switches from page 5 and safe LED tube connection systems from page 10.

NEW

LR158..M-28W



230V LED tubes 1500 mm long, 27 mm diameter, 28W power consumption, luminous flux up to 3920 lm, colour rendering index $R_a > 83$, colour temperatures 3000K, 4000K, 5000K or 6500K. Socket G13, reflected beam angle 140°, enclosure in frosted plastic.

Of course dimmable LED tubes can also be undimmed when switched.
LED tubes are an energy-saving alternative to classic fluorescent tubes and have a much more pleasant illumination. No flickering on switch-on, no flickering in operation, no UV radiation, no IR radiation, no major colour change and no black ends due to ageing.
LED tubes contain no mercury and after up to 50.000 operating hours, they are therefore not classified as hazardous waste but as recyclable electronic scrap.

Tubes with conventional single or double switched electromagnetic ballasts (conventional and low loss ballast) can be simply replaced by tubes and starters.

For technical data, see page 4, dimmer switches from page 5 and safe LED tube connection systems from page 10.

LR15830M-20W	LED tubes 1500mm, 20W, 3000K, warm white	EAN 4010312401477	99,80 €/pc.
LR15840M-20W	LED tubes 1500mm, 20W, 4000K, cool white	EAN 4010312401484	99,80 €/pc.
LR15850M-20W	LED tubes 1500mm, 20W, 5000K, daylight	EAN 4010312401491	99,80 €/pc.
LR15865M-20W	LED tubes 1500mm, 20W, 6500K, cool daylight	EAN 4010312401507	99,80 €/pc.
LR15830M-28W	LED tubes 1500mm, 28W, 3000K, warm white	EAN 4010312401347	99,80 €/pc.
LR15840M-28W	LED tubes 1500mm, 28W, 4000K, cool white	EAN 4010312401354	99,80 €/pc.
LR15850M-28W	LED tubes 1500mm, 28W, 5000K, daylight	EAN 4010312401361	99,80 €/pc.
LR15865M-28W	LED tubes 1500mm, 28W, 6500K, cool daylight	EAN 4010312401408	99,80 €/pc.
LRS	LED tubes starter bridge (Only for spare part orders. 1 unit is enclosed with every LED tube free of charge.)	EAN 4010312400913	1,00 €/pc.

Type designation	LR06830M-12 W LR06840M-12 W LR06850M-12 W LR06865M-12 W NEW	LR12830M-20 W LR12840M-20 W LR12850M-20 W LR12865M-20 W NEW	LR15830M-20 W LR15840M-20 W LR15850M-20 W LR15865M-20 W NEW	LR15830M-28 W LR15840M-28 W LR15850M-28 W LR15865M-28 W NEW
Labelling of dimmable LED tubes				
Length	600mm	1200mm	1500mm	1500mm
Diameter	27 mm	27 mm	27 mm	27 mm
Socket	G13	G13	G13	G13
Weight	210g	365g	470g	470g
Service life in hours, max. approx.	50.000	50.000	50.000	50.000
Supply voltage ¹⁾	230V/50-60Hz	230V/50-60Hz	230V/50-60Hz	230V/50-60Hz
Current draw	0.05A	0.09A	0.09A	0.12A
Power consumption	12W	20W	20W	28W
Power factor	0.98	0.98	0.98	0.98
Ambient temperature max./ min.	+50°C/-30°C	+50°C/-30°C	+50°C/-30°C	+50°C/-30°C
Air humidity	10-90%	10-90%	10-90%	10-90%
Protection degree	IP 50 ²⁾	IP 50 ²⁾	IP 50 ²⁾	IP 50 ²⁾
Colour temp. K and luminous flux lm ± 5%				
Warm white 3000K	1440lm; 120lm/W	2400lm; 120lm/W	2400lm; 120lm/W	3360lm; 120lm/W
Cool white 4000K	1680lm; 140lm/W	2800lm; 140lm/W	2800lm; 140lm/W	3920lm; 140lm/W
Daylight 5000K	1680lm; 140lm/W	2800lm; 140lm/W	2800lm; 140lm/W	3920lm; 140lm/W
Cool Daylight 6500K	1680lm; 140lm/W	2800lm; 140lm/W	2800lm; 140lm/W	3920lm; 140lm/W
Colour rendering index (CRI) R _a	>83	>83	>83	>83
Reflected beam angle	140° ³⁾	140° ³⁾	140° ³⁾	140° ³⁾
Cover 360° (plastic)	frosted	frosted	frosted	frosted
Shatter resistance	yes	yes	yes	yes
Rear	strong aluminium profile inside the 360° cover	strong aluminium profile inside the 360° cover	strong aluminium profile inside the 360° cover	strong aluminium profile inside the 360° cover
Photobiological class as per DIN EN 62471 (RG0 = no risk)	RG0	RG0	RG0	RG0
Energy efficiency class according to EU Directive 874/2012	A++	A++	A++	A++
Weighted energy consumption according to EU Directive 874/2012	12 kWh/1000h	20 kWh/1000h	20 kWh/1000h	28 kWh/1000h

¹⁾ Also suitable for emergency lighting of 130 - 220 V DC.

²⁾ Applications in humid zones can also be implemented using a luminaire with suitable protection class.

³⁾ At the edge of the 140° beam angle, the brightness is still 50%. This value is reduced to 10% at 220°.

Operation in parallel with fluorescent tubes should be avoided since fluorescent tubes generate high voltage peaks.

LED tubes contain no mercury and after up to 50.000 operating hours, they are therefore not classified as hazardous waste but as recyclable electronic scrap. No UV or IR radiation

To dim these 230V LED tubes, we recommend universal dimmer switches FUD14, FUD61NPN, FUD71, EUD12NPN, EUD12D, EUD61NPN and MFZ12PMD.

All dimmable Eltako LED tubes have been certified by KEMA-KEUR to EN and IEC regulations and therefore bear the test mark:

Wireless universal dimmer switches, controlled by wireless and batteryless push-buttons. Simple constant light control with wireless motion/brightness sensors.



Available in white, pure white, pure white glossy, anthracite, black and aluminium.
F4T65 Available in pure white glossy.



Wireless pushbuttons, wireless dimmer switches and motion/brightness sensors are a small part of the Eltako Wireless Building. The complete wireless program can be found in the Eltako catalogue 'The Wireless Building'. In the internet at eltako.com

Master and Slave Universal Dimmer Switches

6

Switch and dim any number of LED tubes using the universal dimmer switches FUD71.

With the FUD71 as master you can already directly dim 33 LED LR06 tubes, 20 LR12 tubes and 20 resp. 14 LR15 tubes.

Every wireless controlled FUD71 as slave increases the connectable number of LED tubes by the same number.

This means that any size of room can be equipped with dimmable LED tubes at low cost.

With additional wireless pushbuttons any number of zones can be added to or subtracted from the total dimming scene.

wireless pushbutton



FUD71



LR15, LR12 and LR06

FUD71



LR15, LR12 and LR06

FUD71



LR15, LR12 and LR06

more FUD71
dimmer switches

FUD71-230 V



Universal dimmer switch, power MOSFET up to 400W. Automatic lamp detection. With adjustable minimum brightness and dimming speed. With switching operation for light alarm clocks, children's rooms and snooze function as well as constant light regulation and master-slave mode. Also with light scene control by PC or wireless pushbuttons. Encrypted wireless, bidirectional wireless and repeater function are switchable. Only 0.7 watt standby loss.

Mounting in the 230V power supply cord, e.g. in false ceilings and lamps.
146mm long, 46mm wide und 31mm deep.

Universal dimmer switch for lamps up to 400W, depending on ventilation conditions.
Dimmable energy saving lamps ESL and dimmable 230V LED lamps, additionally depending on the lamps electronics.

Zero passage switching with soft ON and soft OFF to protect lamps.

The brightness level is stored on switch-off (memory).

In case of a power failure the switch position and the brightness stage are stored and may be switched on when the power supply is restored.

Automatic electronic overload protection and overtemperature switch-off.

Encrypted sensors can be taught in.

You can switch on **bidirectional wireless** and/or a **repeater function**.

Every change in state and incoming central command telegrams are confirmed by a wireless telegram. This wireless telegram can be taught-in in other actuators, in universal displays FUA55 and in the GFVS software. The current dimming value is also displayed in % in the GFVS-Software.

The upper rotary switch determines the operation, whether automatic lamp detection or special comfort positions should work:

AUTO allows the dimming of all lamp types.

EC1 is a comfort position for energy saving lamps, which which by design must be turned on with an increased voltage so that they switch on again in cold state when dimmed down.

EC2 is a comfort position for energy saving lamps, which by design won't switch on again when dimmed down. Therefore Memory is switched off in this position.

LC1 is a comfort position for LED lamps, which by design won't be dimmed down enough in the AUTO position (trailing phase angle) and therefore has to be forced to leading phase angle.

LC2 and **LC3** are comfort positions for LED lamps like LC1 but with different dimming curves.

In positions EC1, EC2, LC1, LC2 and LC3 inductive (wound) transformers may not be used. In addition, the maximum number of dimmable LED lamps may be lower by design than in the AUTO position. **LC4, LC5** and **LC6** are comfort positions for LED lamps like LC1 but with different dimming curves. **PCT** is a position for special functions which were set up using the PCT14 PC Tool. The PCT14 link is hooked up using the data transformer DAT71.

The minimum brightness (fully dimmed down) is adjustable **with the middle % rotary switch**.

The dimming speed is adjustable **using the lower dimming speed rotary switch**.

The pushbuttons can be either taught-in as direction pushbuttons or universal pushbuttons:

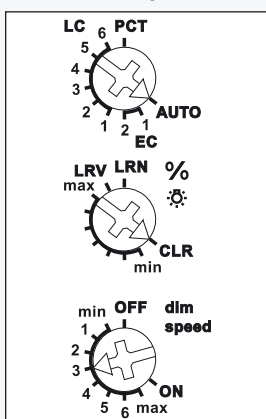
As direction button 'switch on and dim up' is on one side and 'switch off and dim down' on the other side. A double-click on the switch on side triggers the automatic dimming up to full brightness with dim speed time. A double-click on the switch off side triggers the snooze function. The children's room function is triggered on the switch on side. **As a universal pushbutton** the direction change is made by briefly releasing the pushbutton.

For light scene control, constant light regulation, master-slave mode, light alarm clocks, children's rooms and snooze function see operating instructions.

A resettable staircase time switch function with RV = 2 minutes can be called by a pushbutton taught-in as a staircase pushbutton. Brightness level settings can be called during teach-in with single light scene pushbuttons. A twilight pushbutton can be implemented using a taught-in FAH. Switch-on can be performed dependent on motion and brightness with up to 4 FBH devices.

The red LED accompanies the teach-in process and indicates control commands in operation by flashing briefly.

Function rotary switches



Standard setting ex works.

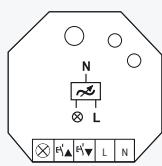
Further settings can be made and actuators configured using the PC Tool PCT14 and the data adapter DAT71.

FUD71-230V	Wireless actuator Universal dimmer switch	EAN 4010312316207	110,70 €/pc.
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Wireless Actuator Universal Dimmer Switch FUD61NPN

8

FUD61NPN-230V



Universal dimmer switch, 300W power MOSFET. Automatic lamp detection. Only 0.7 watt standby loss. With adjustable minimum brightness or dimming speed. With switching operation for light alarm clocks, children's rooms and snooze function. Additionally with light scene control. Encrypted wireless, bidirectional wireless and repeater function are switchable.

For installation. 45 mm long, 45 mm wide, 33 mm deep.

Universal dimmer switch for lamps up to 300W, dependent on ventilation conditions.

Dimmable energy saving lamps ESL and dimmable 230V-LED lamps, additionally dependent on the lamps electronics.

Zero passage switching with soft ON and soft OFF to protect lamps.

Supply voltage, switching voltage and control voltage local 230V. No minimum load.

This dimmer switch is activated by wireless pushbuttons FT and FFT, handheld wireless transmitters FHS and FMH, and remote controls FF8 and UFB.

The brightness level is stored on switch-off (memory).

In case of a power failure the switch position and the brightness stage are stored and may be switched on when the power supply is restored.

Automatic electronic overload protection and overtemperature switch-off.

Starting in production week 11/14, you can teach in encrypted sensors. You can switch on **bidirectional wireless** and/or a **repeater** function.

Every change in state and incoming central command telegrams are then confirmed by a wireless telegram. This wireless telegram can be taught into other actuators like the FSR61NP-230V, universal displays and the GFVS software. The current dimming value is also displayed in % in the GFVS software.

The minimum brightness (fully dimmed) or the dimming speed is adjustable **with the upper %/dimming speed rotary switch.**

The lower rotary switch determines the operation, whether the automatic lamp detection or special comfort positions should act:

AUTO allows the dimming of all light species.

EC1 is a comfort position for energy saving lamps which must be switched on with increased power dependent on the construction, so they will also switch on again safely in cold condition when dimmed down.

EC2 is a comfort position for energy saving lamps which will not be switched on again when dimmed down dependent on the construction. Memory is switched off in this position.

LC1 is a comfort position for LED lamps which are not being dimmed down enough when set to AUTO (trailing phase angle) dependent on the construction and must therefore be forced to leading phase angle.

LC2 and **LC3** are comfort positions for LED lamps like LC1, but with different dimming curves. In positions EC1, EC2, LC1, LC2 and LC3 no inductive (wound) transformers should be used. In addition, the maximum number of dimmable LED lamps can be lower than in the AUTO position dependent on the construction.

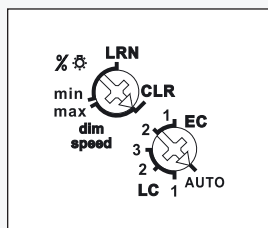
The pushbuttons can be either taught-in as direction pushbuttons or universal pushbuttons:

As direction button 'switch on and dim up' is on one side and 'switch off and dim down' on the other side. A double-click on the switch on side triggers the automatic dimming up to full brightness with dim speed time. A double-click on the switch off side triggers the snooze function. The children's room function is triggered on the switch on side. **As a universal pushbutton** the direction change is made by briefly releasing the pushbutton.

For light scene control, light alarm circuit, children's room circuit and sleep timer, refer to the operator manual.

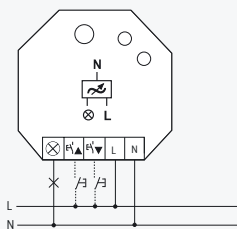
The LED performs during the teach-in process according to the operating instructions. It shows wireless control commands by short flickering during operation.

Function rotary switches



Standard setting ex works.

Typical connection



FUD61NPN-230V

Wireless actuator – Universal dimmer switch

EAN 4010312300299

97,20 €/pc.

Recommended retail prices excluding VAT.

FUD14



Universal dimmer switch, Power MOSFET up to 400W. Automatic lamp detection. Bidirectional. Only 0.3 watt standby loss. With adjustable minimum brightness or maximum brightness and dimming speed. With switching operation for light alarm clocks, children's rooms and snooze function. Also with light scene control and constant light regulation.

Modular device for DIN-EN 60715 TH35 rail mounting. 1 module = 18mm wide, 58mm deep. The delivery includes a spacer DS14, 1 short jumper 1 module (up to 200W load) and 1 long jumper 1.5 modules (from 200W load with DS14 on the left side).

Universal dimmer switch for lamps up to 400W, depending on ventilation conditions, dimmable energy saving lamps (ESL) and dimmable 230V LED lamps are also dependent on the lamp electronics.

Zero passage switching with soft ON and soft OFF to protect lamps.

Switching voltage 230V. No minimum load.

This dimmer switch is activated by wireless pushbuttons FT and FFT, handheld wireless transmitters FHS and FMH, and remote controls FF8, FFD and UFB. A wireless antenna module FAM14 is required for wireless reception.

The brightness level is stored on switch-off (memory).

In case of a power failure the switch position and the brightness stage are stored and may be switched on when the power supply is restored.

Automatic electronic overload protection and overtemperature switch-off.

Connection to the Eltako-RS485 bus. Bus cross wiring and power supply with jumper.

The upper rotary switch LA/LRN is first required for teach-in and defines in operation whether automatic lamp detection should be activated or special comfort positions:

AUTO allows all lamp types to be dimmed.

EC1 is a comfort position for energy saving lamps which must be switched on at high voltage due to their design so that they can be dimmed down and switched back on safely when cold.

EC2 is a comfort position for energy saving lamps which cannot be switched back on in dimmed-down position due to their design. Therefore the memory is switched off in this position.

LC1 is a comfort position for LED lamps which cannot be dimmed down far enough in AUTO (phase cut-off) due to their design.

LC2 and **LC3** are comfort positions for LED lamps like LC1 but with different dimming curves. In positions EC1, EC2, LC1, LC2 and LC3, no inductive (wound) transformers may be used. In addition the maximum number of dimmable LED lamps may be lower than in AUTO position due to their design.

LC4, LC5 and **LC6** are comfort positions for LED lamps such as AUTO but with different dimming curves.

PCT is a position for special functions which are set up using the PC tool PCT14.

The minimum brightness (fully dimmed down) is adjustable **with the middle % rotary switch.**

The dimming speed is adjustable using the **bottom dimming speed rotary switch.**

The pushbuttons can be taught-in either as direction switches or universal switches:

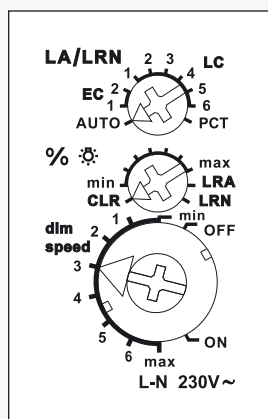
When installed as a direction switch, one side is then 'switch on and dim up' and the other side is 'switch off and dim down'. A double-click on the switch-on side activates automatic dim-up to full brightness at dim speed. A double click on the switch-off side activates the snooze function. The children's room function is implemented on the switch-on side. **As a universal switch**, change the direction by briefly releasing the pushbutton.

For light scene control, constant light regulation, light alarm circuit, children's room circuit and sleep timer, refer to the operating instructions.

When the pushbutton is taught in as a staircase pushbutton, it is possible to retrieve a resettable staircase time switch function with RV = 2 minutes. Individual light scene pushbuttons can be used to retrieve brightness settings carried out during teach-in. A taught-in FAH can be used to implement a twilight switch. Switch-on can take place using up to 4 FBHs depending on motion and brightness.

The LED performs during the teach-in process according to the operating instructions. It shows control commands by short flickering during operation.


Function rotary switches



Standard setting ex works.

Further settings can be made and actuators configured using the PC Tool PCT14.

FUD14	RS485 bus universal dimmer switch	EAN 4010312313749	59,30 €/pc.
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Eltako only uses the save LED tube connection system for its LED tubes. LED tubes with the identification  are dimmable.

- Open pins never carry live voltage if the tubes are plugged into a socket on one side and then twisted.
Do not connect L and N to the same socket base.

- If Eltako LED tubes are used in luminaries instead of fluorescent lamps which were previously operated with a **conventional or low loss ballast**, only the starter needs to be replaced with the supplied starter bridge. Eltako LED tubes can be used in any position. See the wiring examples for **single circuit** and **double circuit**.
If dimmable Eltako LED tubes need to be dimmed, the electronic ballast must be bridged or removed by a qualified electrician.
- If Eltako LED tubes are used in luminaries instead of fluorescent lamps which were operated in **tandem circuits**, they must be rewired and then rewired or bridged like the conventional or low loss ballast. However, this can only be carried out by a qualified electrician using the connection example we specified. Eltako LED tubes can then be used in any position.
- If the starter is not removed from conventional or low loss ballast circuits, or if it was removed but not replaced by a starter bridge, the LED tube does not function but there is no short circuit.
- In addition to the energy consumption of LED tubes, a magnetic ballast which is not removed or not bridged has a high and unnecessary power loss and also causes high **voltage peaks** which shorten the service life of LED tubes. Removal or bridging may only be carried out by a qualified electrician. The power loss of electronic ballasts is much lower, therefore it is not as important to remove or bridge them over, unless the Eltako LED tubes need to be dimmed.
- **If a fluorescent tube is refitted to a lamp that was previously equipped with magnetic or electronic ballast and converted to LED tubes, the previous wiring with magnetic or electronic ballast must be restored to avoid a short circuit.**

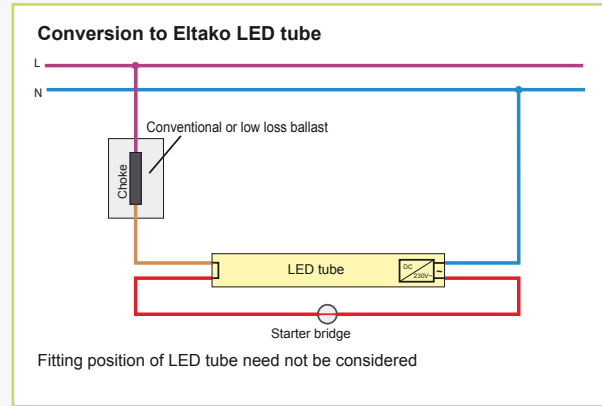
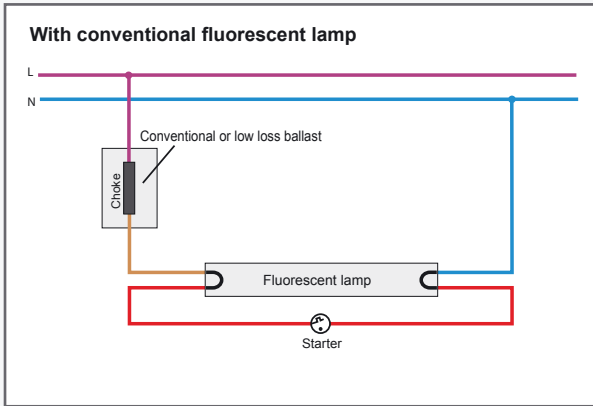
- If Eltako LED tubes are fitted to lamps with an **electronic ballast** instead of fluorescent tubes, it must be rewired and the electronic ballast must be disconnected. However, this can only be carried out by a qualified electrician using the connection example we specified. Eltako LED tubes can then be placed in any position, even several tubes in parallel.
- **If a fluorescent lamp is fitted to a lamp previously fitted with an electronic ballast and converted to LED tubes, the previous wiring with the electronic ballast must be restored to avoid a short circuit.**

Further information

- **Operation in parallel with fluorescent tubes should be avoided since fluorescent tubes generate high voltage peaks.**
- The luminosity of LEDs is mainly dependent on the power feed. If the power feed is too high, it shortens service life. Instead we undershoot the reference values of the LED manufacturer by at least 5% and invest in better LEDs. In addition, we optimise the efficiency of power supply (Power factor 0.98!) and heat dissipation.
- The luminous flux of the LED tube also depends on the colour temperature K and the colour rendering index R_G besides power feed and the number of LEDs. The higher the colour temperature and the lower the R_G value, the brighter the LED tube. A R_G value of 80 may not be undershot, otherwise colours in the room are incorrectly reproduced. An R_G value of > 83 is even better!
- Eltako LED tubes are CE-conformant and comply with EN 62471, EN 62776 as well as IEC 62560.
- All dimmable Eltako LED tubes have been certified by KEMA-KEUR to EN and IEC regulations and therefore bear the test mark: 

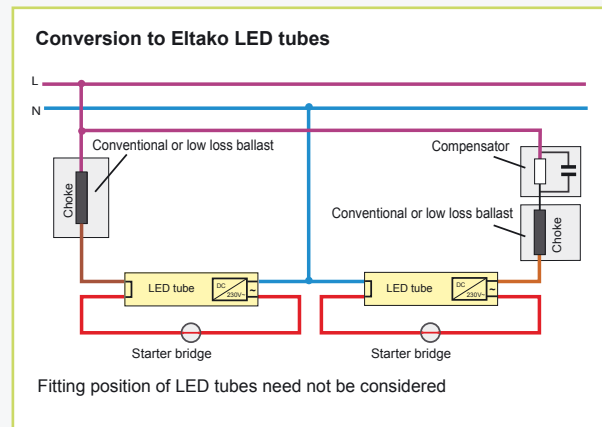
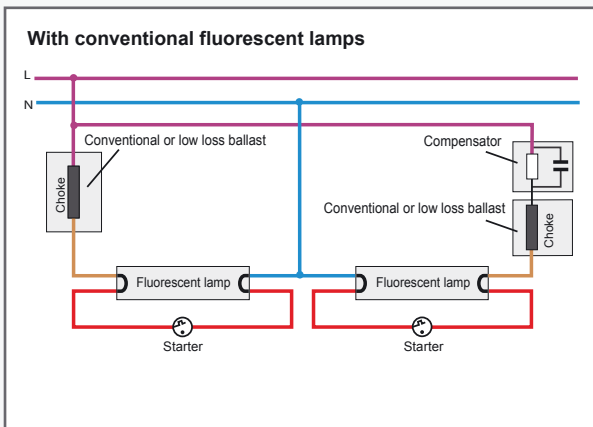
Wiring example of a single circuit luminaire with conventional or low loss ballast.

- No wiring change is required (retrofit lamp), only the starter must be replaced by the starter bridge.
- If dimmable Eltako LED tubes need to be dimmed as well as switched, the electronic ballast must be bridged or removed.**



Wiring example of a double circuit luminaire with conventional or low loss ballast.

- No wiring change is required (retrofit lamp), only the starter must be replaced by starter bridges.
- If dimmable Eltako LED tubes need to be dimmed as well as switched, the electronic ballast and the compensator must be bridged or removed.**

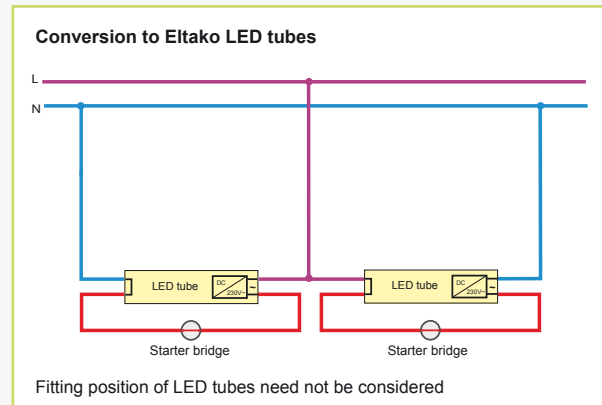
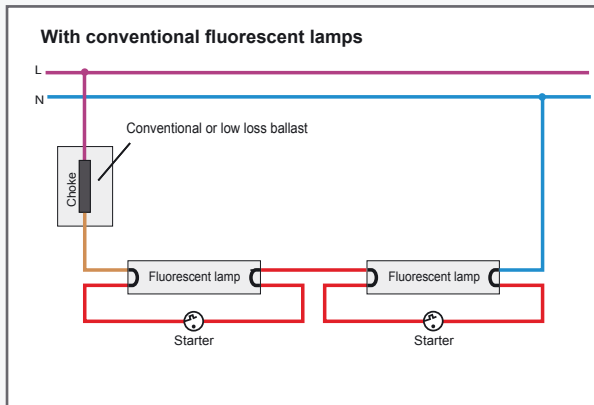


Installation instructions when used as retrofit lamp

- 1) Switch off power supply
- 2) Rotate conventional tubes through 90°
- 3) Remove conventional tubes carefully
- 4) Remove starter
- 5) Fit starter bridge (LRS)
- 6) Fit LED tubes
- 7) Rotate LED tubes through 90°. Note beam direction
- 8) Switch on power supply

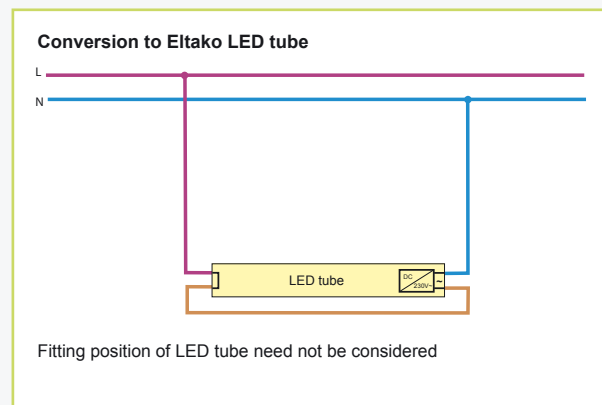
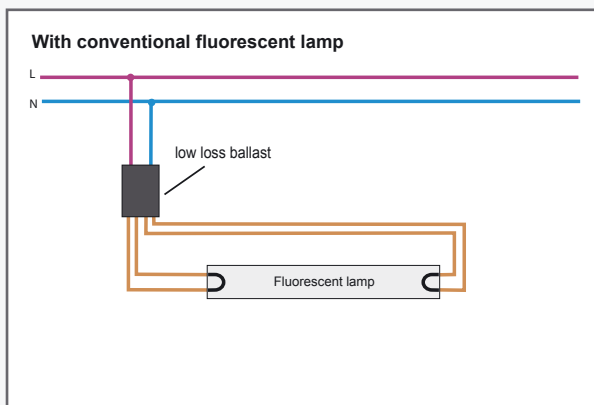
Wiring example of a tandem circuit with conventional or low loss ballast.

■ A wiring change is required (conversion lamp) and starters must be replaced by starter bridges.



Wiring example of a luminaire with electronic ballast.

■ A wiring change is necessary (conversion lamp), but no starter bridge is required.



Installation instructions when used as conversion lamp

- 1) Switch off power supply
- 2) Rotate conventional tubes through 90°
- 3) Remove conventional tubes carefully
- 4) Remove ballast and modify wiring
- 5) Remove starter
- 6) If necessary, fit starter bridge (LRS)
- 7) Fit LED tubes
- 8) Rotate LED tubes though 90°. Note beam direction
- 9) Switch on power supply

You can start small with Eltako Wireless Building

An actuator with two batteryless and wireless pushbuttons is already a very elegant solution to the problem of missing pushbuttons. The old light switch is replaced by a wireless actuator preceded by a wireless pushbutton and any number of other wireless pushbuttons can be fitted. Then of course, the wireless actuator can also be a wireless dimming actuator.

At the other end of the unlimited and wide spectrum of possibilities with the Eltako Wireless Building, there are networked skyscrapers with hundreds of wireless sensors and wireless actuators, in groups or grouped floor by floor, monitored, controlled and visualised by servers GFVS-Safe II and installed software GFVS 3.0.

The 4 stages on the Eltako Wireless Building success ladder

Stage 1

A few wireless sensors and wireless actuators to improve or expand an existing installation. Generally with actuators installed decentrally.



Stage 2

Several wireless sensors and wireless actuators to renovate an existing building or construct a new building but without centralised monitoring, control or visualisation. With actuators installed decentralised and centralised. Smartphone access by app and GSM module.



Stage 3

Several wireless sensors and wireless actuators in a residential building with centralised monitoring, control or visualisation. With a server GFVS-Safe II with integrated wireless antenna module and installed software GFVS 3.0. Actuators mainly installed centrally and supplemented by decentralised installation. With internet access, standard external access to smartphones over the mobile radio network. Visualisation and control from tablet PCs and smartphones.



Stage 4

Many wireless sensors and wireless actuators in a large building with centralised monitoring, control or visualisation. With the server GFVS-Safe II, the software GFVS 3.0, the wireless LAN access points BSC-BAP and gateways to the central computer. Actuators partly installed centrally, partly installed decentrally e.g. in false ceilings. With internet access, standard external access to smartphones over the mobile radio network. Visualisation and control from tablet PCs and smartphones.



Without **Eltako sensors and actuators** no information or control commands can be sent over the wireless network. They form the basis for the **Eltako Wireless Building** and of course they operate without a server if there is no requirement for centralised building monitoring, centralised building control or visualisation. Smartphone access is still possible for Series 14 actuators.

Eltako sensors for switch commands, temperature, brightness, motion, humidity and air quality run partly without external power supply.

Batteryless and cordless **Eltako wireless pushbuttons and hand-held transmitters** generate their own power requirements for wireless telegrams when operated. Many **Eltako sensors** generate their power requirements from a solar cell and save excess energy from daylight to storage capacitors so that there is sufficient energy for troublefree functioning in the dark.

Some of these sensors and solar cells can be made 'winterproof' with additional batteries. Further Eltako sensors have a higher power requirement which they cannot generate themselves and therefore require an external power supply.

Eltako actuators are the backbone of the **Eltako Wireless Building**. They only evaluate directly addressed wireless telegrams in order to switch or control any number of consumers in the building. Many have a **bidirectional function**. This allows them to send back their switch states to the server or displays or directly initiate other functions via actuators. In addition, these actuators may also function as repeaters.

Of course there are specific actuators for either centralised or decentralised installation. If the **Eltako RS485 bus** is installed centrally with rail mounted devices in switch cabinets, a **wireless antenna module FAM14** is used to communicate with the actuators. The RS485 bus can also be used composite or without wireless by means of the **Eltako remote switch system FTS**.

The Eltako Wireless Building uses all Eltako wireless components in an ingenious way and can be installed even in small installations. The components are all downwards-compatible!

All sensors and actuators communicate within the Eltako wireless network by means of telegrams using the world-wide standard of the **EnOcean Alliance**. The batteryless and cordless wireless modules in the Eltako wireless pushbuttons are produced by **EnOcean** in Germany as well as the wireless microchips in the other sensors and actuators.

Eltako therefore develops and manufactures **all** the offered sensors and actuators with the Eltako logo. These are of course compatible with all products made by other manufacturers within the enormous international EnOcean family.

A small selection of our wireless sensors and actuators from the Wireless Building catalogue



F4T65
Wireless push-button without battery or wire



F1FT65
Flat wireless sensor pushbutton with two touch surfaces



UFB-Harmony Touch
Universal remote control from Logitech



FMH2S-wr
Mini hand-held transmitter for calling systems



FBH65S
Motion/brightness sensor



FTR65HS
Temperature controller



FSR14-2x
Impulse switch



FUD14
Dimming actuator 400W



FSR61NP
Switching actuator



FUD61NP
Dimming actuator without N



Remote control FFD

Terms of delivery

Deliveries will be made in conformity with 'General Conditions for the supply of products and services of the Electrical and Electronics Industry', June 2011. All deliveries are subject to an expanded retention of title and are sold according to our price list at the given time.



Only a trained electrician may install our switchgear, power supply units and energy meters, otherwise there is a risk of fire or electric shock. It is therefore prohibited to sell to other customers for this reason otherwise the risk passes to the seller.

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